

REMARKS

Claim 1 has been amended to overcome the rejection under 35 USC 112. In addition, the claim has been amended to specify a capillary tube. Support for this is found at page 4, line 14. The claim has also been amended to make it clear that the sample fluid and particles flow through the illuminated volume and the fluorescent light emitted by particles within the volume is detected.

Claims 1, 3, 5, 8 and 34 are being rejected under 35 USC 103 (a) as being unpatentable over Goix (WO 98/57152) in view of D'Autry Patent No. 3,727,304.

A careful reading of Goix shows that it teaches the use of a pump such as syringe pump connected to one end of a capillary for injecting a test sample into and through a capillary. In the present invention sample is drawn through the capillary. There is an important difference between the two methods of causing sample to flow through the capillary. By drawing sample into the capillary and past the impinging light beam, very small volumes of sample are required, only that small volume of sample which is required to give a meaningful count of particles. In contrast, in the prior art apparatus and other cytometer apparatus a larger volume of sample than that required for analysis is needed in order to fill the pump and associated apparatus. In Applicant's apparatus the sample is drawn directly out of a sample vial or container into and through the capillary. A second and non-obvious advantage is the fact that in the prior art either a disposable pump is required to prevent cross contamination or mixing of the sample, or in the alternative a thorough washing of the pump is required between sample analyses. In contrast, Applicant draws the sample into the suspended end of the capillary directly from the sample vial or container, avoiding any mixing or cross contamination. Claim 1 calls for a pump connected to the first end of the capillary. The second end is suspended for immersion into the sample. The pump draws a sample into the second end of the capillary. This arrangement is not suggested in the primary reference or in any of the secondary references.

The secondary reference D'Autry shows a pipette 22 connected by a conduit 20 to an analysis chamber 14. The bottom of the chamber 14 is connected to a conduit 26 via a conduit 26 by a peristaltic pump 28. It is to be observed that there is no suggestion of a capillary tube in which a predetermined length is illuminated to cause particles in the illuminated length to fluoresce. Although the patentee claims to reduce the volume of sample the quantity is large in comparison to the volume in a capillary.

In brief, a sample handling method carried out in accordance with the D'Autry invention include the steps of intercommunicating the top of the analysis vessel with a sample holding container with a first conduit and intercommunicating the bottom of the analysis vessel by way of a second conduit with a pump. The pump is operated in a first direction of operation for a predetermined period of time and a predetermined quantity of liquid is pulled from the sample holding container into the first conduit leading to the analysis vessel. The first conduit is then removed from the sample holding container and the pump is operated to pull the liquid through the analysis vessel into the second conduit. The direction of operation of the pump is then reversed and a portion of the quantity of liquid is returned from the second conduit into the analysis vessel for analysis. Since it is not necessary to fill the analysis vessel in order to move liquid through the vessel, the amount of liquid required to obtain an uncontaminated sample is greatly reduced. Furthermore, since the liquid is moved entirely through the vessel and then a portion of the liquid is returned back to the vessel, the least contaminated portion of the sample is used for analysis.

It is apparent from the foregoing that a large percentage of the sample is not analyzed. The sample is not analyzed as it flows past an analyzing volume. A small volume of the sample is returned to the analysis chamber where it is analyzed. There is no suggestion of having a sample fluid flow past an analyzing volume in a capillary by a pump-connected to one end of the capillary.

Referring to claim 1, it specifically calls for a capillary through which the sample liquid flows with one end of the capillary suspended for immersion in the sample liquid and the other end to a pump. The sample flows through an illuminated region and fluorescent emission is detected. The primary reference fails to teach or suggest a suspended capillary. The secondary reference teaches a pipette and tubing with an analyzing cell. The sample liquid is not analyzed in the cell as it flows from the sample container. The flow is revised and the liquid is suspended in the analyzing chamber. The sample is not analyzed in a capillary as the sample is pumped from the sample container. It is submitted that Applicant's analyzing apparatus is not an obvious combination of the prior art since the combination would operate in an entirely different manner.


The dependent claims are patentable in that the combination of Goix and D'Autry does not render the limitation of claim 1 obvious and the addition of the secondary references does not

result in Applicant's claimed apparatus. The claims add further limitations not shown in the combined references.

In view of the foregoing it is submitted that the application is now in condition for allowance.

The Commissioner is hereby authorized to charge any fees associated with this communication to our Deposit Account No. 50-2319 (Order No. A-69516/AJT (463032-23)).

Respectfully submitted,


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